YEAR ONE

Death following a first time, isolated coronary artery bypass graft

Interim Report - Data Year 2004/5

A report of the National Confidential Enquiry into Patient Outcome and Death (2006)

NCEPOD

YEAR ONE

Summary

- Return of completed surgical, anaesthetic and organisational questionnaires has been disappointing.

- Return of relevant casenotes has been disappointing.

- A number of units do not provide basic clinical details to either CCAD or SCTS databases. Some of those units who do not make returns to either database are unable to identify basic clinical data fields for matching purposes.

- 11/12 units that do not provide data to CCAD or the SCTS are independent units.

- The main clinical risk stratification tool EuroSCORE is not universally available, and where the data is available the calculated global score is frequently incorrect. This undermines the value of this score as a clinical risk stratification tool.

- Failure to record basic clinical data in some units must raise questions about overall organisation and performance, and effectively prevents meaningful comparison of mortality outcome with those peer units who are able to provide data.

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Recommendations

- **All Cardiac units in the UK should record standard data fields, and should be able to accurately calculate a EuroSCORE for every patient, in order to aid in the process of risk stratification, and to allow comparative audit to be undertaken.**

- **Trusts and independent hospitals must ensure that clinicians have timely access to medical records, and sufficient time allocated within job plans, in order that they may meet their professional obligations to participate in the work of the confidential enquiries.**

- **It is important that Medical Directors, as part of their Clinical Governance commitment, take overall responsibility in ensuring that the participation of their Trust/Group remains high.**

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Introduction

Since the Bristol Inquiry[1], cardiothoracic surgeons have been under intense pressure to produce surgeon specific mortality rates to allow results to be compared. The publication of these data is widely supported with the proviso that it is done so responsibly. The publication of data that is not risk adjusted can be misleading and has the potential to do harm because surgical units may have differences in casemix reflecting geography, cardiological practice or surgical expertise and the comparison may be unfair. Similarly, as surgeons' professional careers develop, the nature of their practice changes to reflect specialist interests and increased expertise. The publication of crude mortality league tables, without clarification of the reasons for variation has the potential to distort referral patterns and funding.

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The most commonly used model for clinical risk adjustment in cardiothoracic surgery is the EuroSCORE[2]. This provides risk stratification based on pre-operative factors. However, there are problems with this model, as it has been shown to over-predict mortality rates in low risk patients and under-predict mortality in high risk patients[3,4]. Furthermore, while there has been much research performed to identify clinical risk factors associated with patient outcome following coronary artery bypass graft (CABG)[5], there has been limited work conducted on the impact of organisational factors[6].

Surgeons have become increasingly concerned that publication of individual surgeon's mortality rates would fuel the perception that surgical outcomes were exclusively dependent on the technical ability of the surgeon, without acknowledging external or institutional influences. This has been addressed by Lilford et al[7] in a paper examining the use of both process and outcome data. By determining areas of care that influence patient outcome, other than just the surgical procedure they undergo, factors that lie behind mortality rates may be more clearly understood and defined. This is an essential step in refining systems of care and ensuring that mortality data for individual surgical teams is taken in context.

The National Confidential Enquiry into Patient Outcome and Death (NCEPOD) was approached by the Society of Cardiothoracic Surgeons (SCTS) to conduct an independent study reviewing the care of patients undergoing first time, isolated CABG surgery and to identify the effect of such organisational factors on patient outcome. The study will take place over a three year period (2004-2007). It will adopt the standard NCEPOD peer review of questionnaires and casenotes but will also have an additional case control aspect. The work is also supported by Association of Cardiothoracic Anaesthetists and the British Cardiac Society.

This interim report provides an overview of the data returned for the first year of the study (1st April 2004 to 31st March 2005). All counts were taken in October 2005 and the report represents participation at that time. Only data which cannot introduce bias to the ongoing study has been described. However, any cases reviewed in the first year that have been scored, by a group of advisors, as cause for concern, will be dealt with promptly by the standard NCEPOD method for 'Cause for Concern' cases. These cases are where the advisor group felt that the pattern of practice fell below a standard, which indicates that the practitioner or team or Trust/ Group is likely to put future patients at risk if not addressed.†

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† Cases that cause NCEPOD concern are referred back to the medical director of the trust concerned in order that appropriate action may be taken. The consultant involved with the case is also notified. The Chief Executive of NCEPOD is the only person to access the name of the medical director and clinician involved. The Chief Executive writes with the caveat that NCEPOD does not have the full casenotes and it is not therefore appropriate for NCEPOD to make a firm judgement on the case. This approach was given support by the GMC in 1999 and was ratified by the NCEPOD Steering Group in March 2001 and more recently in April 2005. This approach meets the requirements laid down by the GMC in Good Medical Practice.

Expert Group

At inception a group of experts were formed to steer this project. The group comprises cardiothoracic surgeons, cardiothoracic anaesthetists, cardiologists, a pathologist, an intensivist and a lay representative.

Consensus Method

Prior to the start of the study a consensus exercise was run in collaboration with the Clinical Operational Research Unit (CORU) from University College London (UCL) and the expert group. The aim was to identify what factors of care should be reviewed. It first involved a postal exercise whereby all experts provided their thoughts on what factors contributed to patient outcome, other than the recognised clinical risk factors. The group then met and their thoughts were ranked in order of importance and discussed. At this stage some factors were discarded or combined with others. This group discussion and ranking was then repeated until the group believed they had a list of desired study questions ranked in priority order (Figure 1).

Aim

The aim of this study is to identify remediable factors in the care of patients undergoing a first time, isolated CABG.

1	To what extent does variation in referral and admission processes affect outcome?
2	To what extent do institutional approaches to retrospective multidisciplinary case review and audit vary?
3	To what extent does the scheduling of operations affect outcome?
4	To what extent does the in-hospital process of reviewing unstable cases affect outcome?
5	Was the operation performed appropriate for the patient and the circumstances?
6	To what extent does variation in the anaesthetic process affect outcome?
7	To what extent does variation in prospective multidisciplinary case planning affect outcome?
8	To what extent does variation in patient investigation processes affect outcome?
9	To what extent does the identification and management of peri-operative complications affect outcome?
10	To what extent does the appropriateness of postoperative facilities and support affect outcome?
11	To what extent does variation in medical or interventional management pre-operatively affect outcome?
12	Is continuity of care and communication a factor that affects outcome?
13	Are there identifiable changes in care processes that could reduce the influence of comorbidities on outcome?

Figure 1. Study questions determined by consensus exercise

Method

Hospital participation

National Heath Service (NHS) and Independent hospitals in England, Wales, Northern Ireland and Scotland that perform coronary artery bypass grafting are participating, not just those that submit data to the SCTS.

Data collection

All deaths, in hospital, following a first time isolated CABG, between April 1st 2004 and 31st March 2005, were reported to NCEPOD on an Excel spreadsheet. The data provided were the patient casenote number, date of birth, sex, date of admission, date of procedure, procedure performed, date of death, surgeon and anaesthetist details. A questionnaire was then sent to the consultant surgeon and consultant anaesthetist involved in the procedure. NCEPOD requested that these questionnaires were completed and returned with photocopied extracts of the casenotes. Additionally, an organisational questionnaire was sent to a nominated contact from every department of cardiothoracic surgery in the UK participating in the study.

Case control

For the first time NCEPOD will be matching patients who died to surviving control patients. The control patients will be selected from a pool comprising data from the Central Cardiac Audit Database (CCAD) and, where possible, from the centres that do not submit to the CCAD. Only deaths occurring at centres for which control data is available will be included in this aspect of the study. For each case, a control will be identified that matched the patient who died in terms of age, sex, left ventricular function, operative priority and diabetic status. Due to a complete dataset being required before matching could take place no case control analysis is presented in this report.

Advisor groups

A panel of advisors were selected, representing cardiothoracic surgeons, anaesthetists and cardiologists. Each case and control will be anonymously peer reviewed within the panel to determine the standard of care given to each patient.

Overview of data returned

Hospital participation

Although all the Cardiothoracic Centres who agreed to participate in the study did report the deaths following a first time, isolated CABG, it is of concern that 13 (24%) of the Centres, having agreed to participate in the study, did not complete and return the organisational questionnaire (Figure 2).

Data collection

Of the 480 deaths reported, 81 were excluded, because they did not meet the study criteria. The main reasons were:

a) miscoding – e.g. the patient was coded, by the Centre, as having an isolated CABG but in fact had had another procedure at the same time.

b) duplicate case

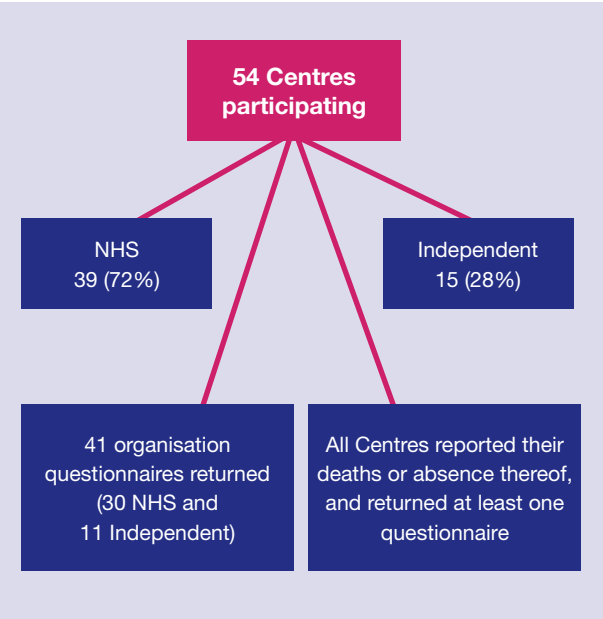

Figure 2. Hospital participation

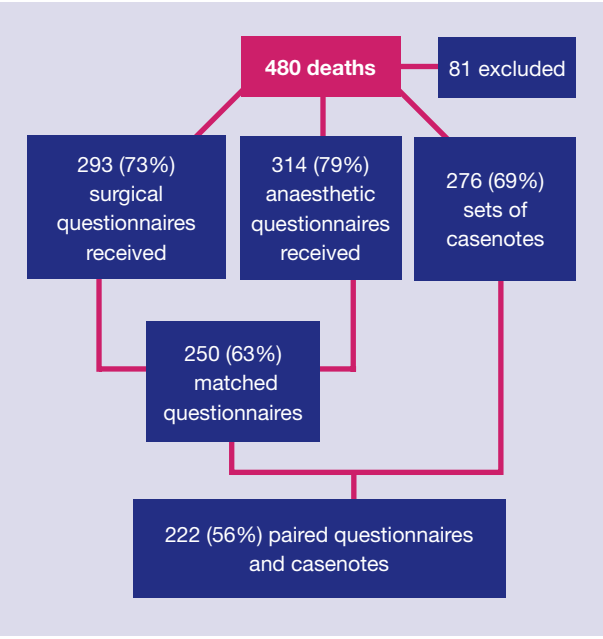

Figure 3. Overview of the data returned

The number of deaths reported to NCEPOD was broadly in line with that predicted given a fairly constant annual rate over the last 5 years of first time CABG of 20,000 and a reported mortality rate of 2%[4]. NCEPOD therefore expected approximately 400 reported deaths. It seems likely that the 399 eligible deaths reported to NCEPOD represented a near complete sample of the actual deaths for first time isolated CABGs performed within a year within the UK.

Of the 399 cases eligible for entry to the study, 293/399 (73%) surgical questionnaires and 314/399 (79%) anaesthetic questionnaires were received, but in only 250/399 (63%) were the questionnaires paired from both the anaesthetist and surgeon (Figure 3).

Furthermore, in only 276/399 (69%) were casenotes received, and this meant that the full information of surgical and anaesthetic questionnaires and casenote extracts was only available in 222/399 (56%).

By comparison with previous studies involving surgeons and anaesthetists, there has been a disappointing participation rate in terms of return of clinical questionnaires. In NCEPOD's 2002 report *'Functioning as a Team?'* the return rate for surgeons was 88% and for anaesthetists 89%[8].

The present poor return rates have been achieved despite extreme efforts having been made by the non-clinical NCEPOD staff to encourage clinicians to return questionnaires. Centres received reminders by post and, where possible, individual telephone calls to clinicians were made. The return rate is particularly disappointing given that it was specialist clinicians who, through the SCTS, requested that NCEPOD undertake the present study. Where reasons have been provided for the non-return of questionnaires, the most common is that the casenotes are not available at the hospital.

Data for case control analysis

Originally a number of factors, used in the EuroSCORE calculation, were to be used to match cases to controls. We were aware from the SCTS audit that the global additive EuroSCORE was not available, to them, for risk stratification in 30% of cases[4]. In fact, the global additive EuroSCORE was supplied to NCEPOD in 81% of the 293 surgical questionnaires returned. The EuroSCORE matrix, supplied in the questionnaire, was also completed in 90% of the questionnaires, allowing us to derive the EuroSCORE in a further 9% of cases to bring the total to 90%. However, in those cases where an additive EuroSCORE and the EuroSCORE matrix were both provided, in only 146/223 (65%) was the EuroSCORE value the same.

If units are not calculating the EuroSCORE correctly then this has the potential to devalue the EuroSCORE as a clinical risk stratification tool.

With advice from CORU, the expert group decided that matching between cases and controls would be done using 5 key factors, all of which, bar diabetes, were constituent parts of the EuroSCORE matrix but were more consistently available:

1 Age 2 Sex 3 Left ventricular function

4 Priority 5 Diabetes

It had been envisaged, these data would be readily available from CCAD. However, it transpired that only 28/38 (74%) of those units contributing data to the SCTS database contributed to CCAD. Furthermore 12/54 (22%) of units contributed data to neither SCTS nor CCAD databases. The majority (11/12) of these units were independent units. Although a significant number of units, these were in the main smaller independent units, and the total deaths attributable to these units in this study were only 2/399 (<1%).

Audit leads in those units that did not supply data to either SCTS or CCAD databases were contacted, and 2/12 indicated that they would not be able to identify control patients using the matching criteria, as they did not record these on a searchable database.

Future progress

To continue peer review of cases and testing of case control questions against matched cases from those units for whom data is available. Whether or not a site is able to provide data on surviving controls may well be associated with some of the institutional factors being studied. To avoid biasing the analysis, the case control analysis will be restricted to those centres that are able to provide data on surviving controls.

References

1 The Bristol Royal Infirmary Inquiry. The report of the public inquiry into children's heart surgery at the Bristol Royal Infirmary 1984-1995. Learning from Bristol. http://www.bristol-inquiry.org.uk Crown Copyright 2001.

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8 NCEPOD. Functioning as a team? 2002.

Participation

Trust/Group	No. of sites	No. of cases	Surgical q. received	Anaesthetic q. received
North Glasgow University Hospitals Division	2	25	17	13
Lothian University Hospitals Division	1	9	3	7
Grampian University Hospitals Trust	1	8	4	8
Bart's and The London NHS Trust	2	17	3	5
Blackpool, Fylde and Wyre Hospitals NHS Trust	1	8	8	8
Brighton and Sussex University Hospitals NHS Trust	1	13	13	13
BUPA	6	1	1	1
Capio Healthcare UK	1	0	-	-
Cardiff and Vale NHS Trust	1	6	2	5
Central Manchester & Manchester Children's University Hospital NHS Trust	1	4	4	3
Cromwell Hospital	1	2	1	2
Guy's & St Thomas' Hospital NHS Foundation Trust	1	22	9	15
Hammersmith Hospitals NHS Trust	1	7	4	7
HCA International	3	5	3	5
Hull and East Yorkshire Hospitals NHS Trust	1	11	9	10
King Edward VII Hospital	1	2	2	2
King's College Hospital NHS Trust	1	7	7	6
Newcastle upon Tyne Hospitals NHS Trust	1	9	8	8
Nottingham City Hospital NHS Trust	1	5	4	4
Nuffield	3	0	-	-
Oxford Radcliffe Hospital NHS Trust	1	16	16	15
Papworth Hospital NHS Foundation Trust	1	22	21	19
Plymouth Hospitals NHS Trust	1	8	6	8
Royal Brompton and Harefield NHS Trust	2	13	11	12
Royal Group of Hospitals & Dental Hospitals & Maternity Hospitals (NI)	1	15	11	12
Sheffield Teaching Hospitals NHS Foundation Trust	1	17	15	13
South Manchester University Hospitals NHS Trust	1	6	6	6
South Tees Hospitals NHS Trust	1	7	7	7
Southampton University Hospitals NHS Trust	1	15	12	14
St Anthony's Hospital	1	0	-	-
St George's Healthcare NHS Trust	1	10	9	8
St Mary's NHS Trust	1	3	2	2
Swansea NHS Trust	1	1	1	1
The Cardiothoracic Centre Liverpool NHS Trust	1	26	18	24
The Leeds Teaching Hospitals NHS Trust	1	14	14	7
The Royal Wolverhampton Hospitals NHS Trust	1	6	0	5
United Bristol Healthcare Trust	1	11	9	9
University College London Hospitals NHS Foundation Trust	1	11	7	6
University Hospital Birmingham NHS Foundation Trust	1	8	4	5
University Hospital of North Staffordshire NHS Trust	1	7	5	2
University Hospitals Coventry and Warwickshire NHS Trust	1	8	7	8
University Hospitals of Leicester NHS Trust	1	14	10	9

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Disclaimer

The recommendations contained in this report represent the view of NCEPOD, which was arrived at after a careful consideration of the available evidence. Health professionals are expected to take it into account when exercising their clinical judgement. It does not, however, override their individual responsibility to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

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Publication of future reports

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